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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,270	03/27/2001	Ryoichi Inanami	03180.0278	7690

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EXAMINER	
JOHNSTON, PHILLIP A	

ART UNIT	PAPER NUMBER
2881	

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07/11/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/817,270	INANAMI ET AL.	
	Examiner	Art Unit	
	Phillip A. Johnston	2881	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-34* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-34* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *3-26-2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Detailed Action

1. This Office Action is submitted in response to the appeal brief filed 1-26-2007, wherein claims 1-34 are pending.

2. The examiner agrees with those arguments presented in the appeal brief and as a result, the rejections in the previous Final Office Action mailed 5-26-2006 are withdrawn, and a new Office Action is submitted below which will hopefully more clearly define the examiners position.

Claims Rejection - 35 U.S. C. 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

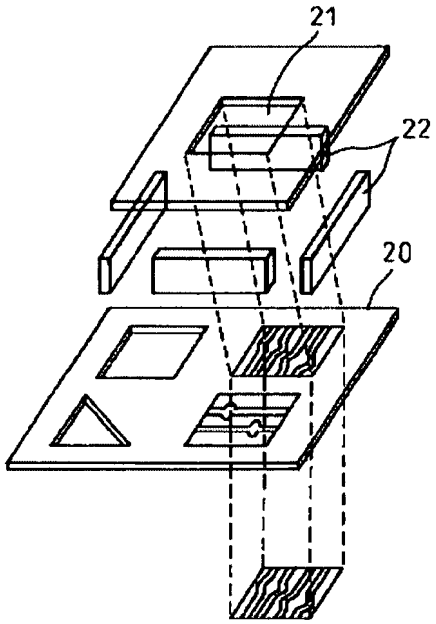
4. Claims 1-21,24,26,28,32, and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Kawakami, U. S. Patent No. 6,546,544.

5. Regarding claim 1, Kawakami teaches a charged beam exposure for delineating patterns of systems on substrates to describe the systems in logic expressions, to convert the logic expressions into connections of standard cells, and to delineate patterns of the standard cells on the substrates, comprising:

(a) a beam generation source generating charged beams (See item 11 in Figure 1; and Col. 2, line16-38);

(b) Character Projection (CP) apertures having shaping holes of the charged beams having shapes of one hundred or more characters having shapes of the standard cells (See block mask 20 in Figure 2A below; and Col. 3, line 1-26);

Fig.2A



(c) standard cell library recording means for recording a standard cell library having an information configured to design the patterns of the systems by using the standard cells having functions, shapes of outlines, and input/output positions of the standard cells, and for recording the standard cell library having first placement positions of the shaping holes on said CP apertures related to the standard cells corresponding to the shaping holes (See basic cell library 52, at Col. 7, line 58-67; and Col. 8, line 44-51);

(d) Character Projection (CP) aperture decision means for conducting logic synthesis for the CP apertures using only the standard cells corresponding to the

shaping holes placed on first placement positions on the respective CP apertures; for selecting one of the CP apertures for which the logic synthesis is conducted by using only the standard cells on the one of the CP apertures, which satisfies designated constraints of the systems, and which has the highest throughput in delineating one of the patterns of the systems on the substrates by using only the standard cells on the one of the CP apertures; for conducting logic synthesis again for the respective CP apertures without a constraint on using only the standard cells on the one of the CP apertures; and for selecting one of the CP apertures, for which the logic synthesis is conducted again, and which has a throughput higher than a desired throughput in delineating one of the patterns of the systems on the substrates based on the standard cell library. See Col. 3, line 36-55; Col. 7, line 58-67; and Col. 8, line 1-34, where Kawakami teaches that basic (standard cells) are first designed with cell design process 51 and stored in cell library 52, then using device design means 53, the cells are arranged with reference to the cell library 52 and wiring is laid between the cells thereby, to design the desired device, and is stored as layout data 54. The cell library 52 is the basic resource and is used repeatedly for designing several types of device layout, which would inherently include the claimed, performing logic synthesis again. (See also the layout A and layout B discussion at Col. 8, line 8-51);

(e) placement and routing means for calculating second placement positions of the standard cells on the substrates, the standard cells corresponding to the shaping holes provided on the selected one of the CP apertures based on the standard cell library (See layout data 54 at Col. 8, line 8-28;

(f) pattern data recording means for recording second placement positions of the standard cells on the substrates, the second placement positions associated with the standard cells corresponding to the first placement positions on the selected one of the CP apertures (See Col. 9, line 41-54; and note different block patterns placed on aperture plate 20 in Figure 2A above and in Figure 8);

(g) a character select deflector irradiating the charged beams onto the shaping holes at the first placement positions on the selected one of the CP apertures (See block mask 20 in Figure 1 and deflector 22 in Figure 2A; and Col. 2, line 16-38); and

(h) an objective deflector irradiating the charged beams onto the second placement positions on the substrates (See deflectors 16 and 17 in Figure 1; and Col. 2, line 16-38).

6. Regarding claim 7, Kawakami teaches all the required limitations therein, as described above regarding claim 1, wherein Kawakami also teaches using the analysis process 74 to determine which cells are to be included in mask apertures based on frequency of use and system restraint information, after which the variable rectangle exposure method (non standard cell constraint) is employed to expose the remaining small patterns with high efficiency. See Col. 3, line 5-10; and Col. 8, line 8-20.

7. Regarding claim 15, Kawakami teaches all the structural limitations of claim 15, as described above regarding claim 1.

8. Regarding claims 2,5,8,16, and 26, Kawakami teaches selecting the variable rectangle method to expose small patterns with high efficiency. See Col. 3, line 5-10; Col. 6, line 1-12; and Col. 8, line 8-20.

9. Regarding claim 3, Kawakami teaches a lens demagnifying the irradiation pattern of one of the charged beams on the substrate. See the parallel beam taught at Col. 2, line 16-35.

10. Regarding claims 4 and 6, Kawakami teaches a standard cell library recording means further records input and output positions of signals of the standard cells, and the shaping holes have a shape of one of the standards cell having a higher frequency of use or a shape of one of the standard cells corresponding to reducing a number of shots by CP exposure, as taught above regarding claim 1.

11. Regarding claim 9, Kawakami teaches the shaping holes have a shape of one of the standards cell having a higher frequency of use or a shape of one of the standard cells corresponding to reducing a number of shots by CP exposure. See design rule and extraction means taught at Col. 3, line 35-55.

12. Regarding claims 10 and 18, Kawakami teaches creating a new CP aperture if the CP apertures cannot satisfy the specification. (See Col. 9, line 40-47).

13. Regarding claims 11-14,19-21, and 32 Kawakami teaches all the limitations therein as described above regarding claim 7, and in addition Kawakami teaches a standard cell library recording means that includes an identification code of one of the CP apertures on which the shaping holes having the shapes of the standard cells are formed and the first placement positions, and provides the recorded magnitudes, functions and performances of the standard cells, the identification code and the first placement positions to said CP aperture decision means. See the block pattern group numbers 92-94 in Figure 8 (aperture identification code), and Col. 9, line 41-54.

14. Regarding claim 17, Kawakami teaches all the structural limitations therein, as pointed out above regarding claim 15, at Col. 3, line 36-55; and Col. 9, line 41-47.

15. Regarding claims 24 and 28, Kawakami teaches the systems are logic products, and the standard cells have shapes of the characters having shapes corresponding to the shaping holes are circuits having functions making logic expressions for logic synthesis, at Col. 3, line 36-55.

16. Regarding claim 34, Kawakami teaches the logic products are at least one of application specific ICs and system LSI's, the standard cells having shapes of the characters having shapes corresponding to the shaping holes are at least one of an AND circuit, a flip-flop circuit, and an inverter. See the LSI teaching at Col. 3, line 36-55.

17. Claims 22,23,25,27,29-31, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,546,544 to Kawakami, in view of Hoshino, U.S. Pat. No. 6,225,025.

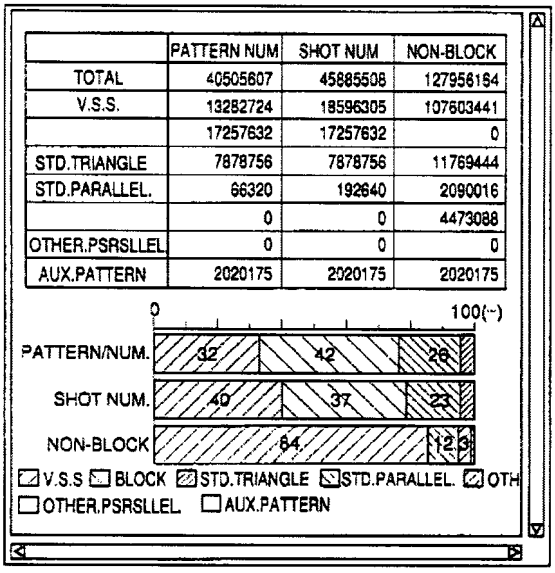
18. Regarding claim 22,23,25,27,29-31, and 33, Kawakami, as described above teaches a CP aperture creation means for listing the standard cells in an order of frequency of use of each of the standard cells used by the systems, as well as all the required limitations of claims 22,23,25,27,29-31, and 33.

19. Kawakami fails to teach standard cell usage in an order according to a difference between a variable shaped beam (VSB) shot number, defined as a number of exposures of a one of the standard cells with VSB exposure, and a CP shot number, defined as a number of exposures of the one of the standard cells with CP

exposure; and means for creating a new CP aperture based on the listed standard cells if the CP apertures cannot satisfy the desired throughput.

20. Hoshino teaches standard cell usage in an order according to a difference between a variable shaped beam (VSB) shot number, defined as a number of exposures of a one of the standard cells with VSB exposure, and a CP shot number, defined as a number of exposures of the one of the standard cells with CP exposure. See Col. 19, line 60-67; Col. 20, line 1-45; and Figure 37 below.

FIG. 37



21. Hoshino modifies Kawakami to provide a means for performing a shot number analysis that discriminates between exposure patterns created by variable beam exposure (VSB) and block exposure processes in order to reduce the number of shots in the exposure.

22. Therefore it would have been obvious to one of ordinary skill in the art that Kawakami would use a shot number analysis that discriminates between VSB and Block exposure patterns, to provide an improved throughput.

Conclusion

23. Any inquiry concerning this communication or earlier communications should be directed to Phillip Johnston whose telephone number is (571) 272-2475. The examiner can normally be reached on Monday-Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiners supervisor Robert Kim can be reached at (571)272-2293. The fax phone number for the organization where the application or proceeding is assigned is 571 273 8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

PJ

July 9, 2007

ROBERT KIM
SUPERVISORY PATENT EXAMINER